$$
A concise way to see both results is as follows:

1. **Length of the body diagonal**

   A rectangular prism with edges $4.0\text{cm}, 2.0\text{cm}$, and 3.0cm has a body (space) diagonal of length

   $$\sqrt{4.0^2 + 2.0^2 + 3.0^2} \;=\; \sqrt{16 + 4 + 9} \;=\; \sqrt{29} \;\approx\; 5.4\text{cm (to one decimal place).}$$

2. **Measure of $\angle AFH$**

   The angle $\angle AFH$ is formed at F by the **body diagonal** $\overline{AF}$ and the **base diagonal** $\overline{FH}$. In a convenient coordinate setup (taking F as the origin),

   - $F = (0, 0, 0)$,
   - $H = (4,\ 2,\ 0)$ (diagonally opposite F in the 4cm×2cm base),
   - $A = (4,\ 2,\ 3)$ (directly above H, giving the full 3cm height).

   Then

   $$\overrightarrow{FA} = (4,\ 2,\ 3), \quad \overrightarrow{FH} = (4,\ 2,\ 0).$$

   Their dot product is

   $$\overrightarrow{FA} \cdot \overrightarrow{FH} = (4)(4) \;+\; (2)(2) \;+\; (3)(0) \;=\; 16 + 4 + 0 \;=\; 20,$$

   and their magnitudes are

   $$\|FA\| = \sqrt{4^2 + 2^2 + 3^2} = \sqrt{29}, \quad \|FH\| = \sqrt{4^2 + 2^2 + 0^2} = \sqrt{20}.$$

   Hence

   $$\cos(\angle AFH) \;=\; \frac{\overrightarrow{FA} \cdot \overrightarrow{FH}}{\|FA\|\,\|FH\|} \;=\; \frac{20}{\sqrt{29}\,\sqrt{20}} \;=\; \frac{20}{\sqrt{580}} \;\approx\; 0.8305.$$

   Taking the inverse cosine (in degrees) gives

   $$\angle AFH \;\approx\; 34.0^\circ \text{ (to one decimal place).}$$

Answer:

- $AF \approx 5.4\text{cm}$
- $\angle AFH \approx 34.0^\circ$

$$